DISCUSSION OF THE CLAIMS

Support for amended Claims 8 and 13 is found in Fig. 2 and at specification page 9, lines 10-16.

Support for new Claims 24 and 25 is found at specification page 7, lines 19 to continuing page 8, line 1.

No new matter has been added.

REMARKS/ARGUMENTS

Applicants thank Examiner Langman for allowing Claims 11, 12 and 18-20.

The rejection of Claims 8-10, 13-17 and 21-23 under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. 103(a) as being unpatentable over Douglass et al. (US 3,163,563), Lopez et al (US 5,916,377) or Garg et al (US 5,126,206) is traversed.

Douglass discloses forming a MC carbide (monocarbide) or M_2C carbide (hemicarbide) layer on a tantalum substrate (see Douglass, Claim 1). Lopez discloses forming titanium carbides along grain boundaries of a tantalum substrate (see Lopez, Claim 1). Garg discloses a substrate coated with a polycrystalline diamond layer (see Garg, Claim 1). However, none of the references disclose a tantalum carbide material having TaC layers formed by having the carbon penetrate the surface of the tantalum or tantalum alloy and having fibrous crystals within the same TaC layer having the same growing direction as in amended Claims 8 and 13. Furthermore, none of the references disclose a process removing Ta_2O_5 formed on the surface of the tantalum substrate prior to carbon penetration. For anticipation under 35 U.S.C. 102, the reference "must teach every aspect of the claimed invention either explicitly or impliedly" (see, MPEP 706.02 Sec.V). None of the references disclose a tantalum carbide material as in amended Claims 8 and 13.

As to the Ta_2O_5, Applicants disclose as follows (see specification page 6, lines 11-21, emphasis added):

> Even if the native oxide layer Ta_2O_5 of the surface of the Ta substrate is reacted with the carbon atoms at a low temperature of 1300°C to 1600°C, the native oxide layer of Ta_2O_5 is chemically stable, the carbonization speed of Ta is low, and the diffusion depth of the carbon atoms is very shallow. Thereby, even if the carbon atoms are diffused and the TaC layer is grown by performing the vacuum heating annealing for tens of hours, a desired thickness is not obtained. Simultaneously, crystal grains grow greatly by heating for a long period of time to be formed in a bulk shape, and the boundary is also larger. It is considered that the boundary between the Ta substrate and TaC is clearly divided, and the delamination between the layers and the crack in the TaC layer are easily generated.

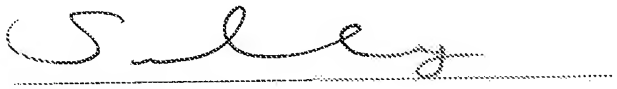
As disclosed above, Applicants have discovered the relationship between Ta_2O_5 and a TaC layer and that by removing Ta_2O_5 layer formed on the surface of the tantalum substrate prior to carbon penetration, a tantalum carbide material having TaC layers formed by having the carbon penetrate the surface of the tantalum or tantalum alloy and having fibrous crystals within the same TaC layer having the same growing direction as in amended Claims 8 and 13 can be obtained. None of the references disclose or suggest the relationship between Ta_2O_5 and a TaC layer or a process to obtain a tantalum carbide material as in amended Claims 8 and 13. The Office requests evidence showing that "the prior art products do not necessarily possess the characteristics of the claimed products" (see Office Action, page 4). In addition to the declaration of December 16, 2010, the newly submitted declaration herewith demonstrates that a tantalum carbide material as in Douglass where Ta_2O_5 layer formed on the surface of the tantalum substrate prior to carbon penetration is **not** removed does **not necessarily and/or inherently** have TaC layers where fibrous crystals within the same TaC layer have the same growing direction; and a growing direction of fibrous crystals within a TaC layer is different from that of fibrous crystals within a different TaC layer. *In re Oelrich*, 666 F.2d 578, 581 (CCPA 1981), instructs that the fact that a certain thing may result from a

given set of circumstances is not sufficient to prove inherency. Inherency may not be established by probabilities or possibilities. Something that is inherent must inevitably be the result each and every time. "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill in the art. Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999)(citations omitted). In fact, none of the references recognize the importance of removing Ta_2O_5 formed on the surface of the tantalum substrate prior to carbon penetration to obtain TaC layers having fibrous crystals as in amended Claims 8 and 13. Thus, in light of the teachings of the references cited, one of ordinary skill in the art would not have foreseen a tantalum carbide material as in amended Claims 8 and 13 and the dependent claims therefrom. Withdrawal of the rejection is respectfully requested.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, L.L.P.



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